

THE PYRAMID OF TENAYUCA: X-RAYING OF DOCUMENTS: CHEMISTRY IN ANCIENT PERSIA:
A SHORT VIEW OF DUTCH ART: THE ASTRONOMICAL OBSERVATORY IN PEIPING

ART AND ARCHAEOLOGY



AN EARLY CHEMICAL DIAGRAM

THE ARCHAEOLOGICAL SOCIETY OF WASHINGTON

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THE ARTS THROUGHOUT THE AGES

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FIG. 1. APPEARANCE OF THE PYRAMID BEFORE EXCAVATION.



FIG. 2. THE PYRAMID ONE YEAR AFTER THE DEBRIS HAD BEEN REMOVED.

ART *and* ARCHAEOLOGY

The Arts Throughout the Ages

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THE PYRAMID OF TENAYUCA

By EDUARDO NOGUERA

*Translated from the original Spanish by Arthur Stanley Riggs
Photographs by courtesy of the Mexican Government*

THE most important archaeological discoveries made during recent years in Mexico have without doubt been those dealing with the Pyramid of Tenayuca, situated a short distance to the north of the City of Mexico. These discoveries have clearly demonstrated and confirmed the chief characteristics of the architecture peculiar to the Aztecs, who so valiantly went down before the inrush of the European in the XVIth century.

Hitherto little has been known respecting the architecture of this important people. The ancient Tenoxtitlán, the fortified capital of the Aztecs, was obliterated by the Spaniards in their reduction of the country and subsequent establishment of their dominion. Only a few isolated edifices escaped this wholesale destruction, thanks in part to having been erected outside the confines of the city, in part because

they had been erected by the Nahua tribes who were prior occupants of the Valley of Mexico.

For five years, beginning in 1925, the work of exploring these monuments has gone steadily on. Only now is the combined work of repair and conservation at an end. Hand in hand with it has gone the study of the history of the pyramid, made possible by means of the inscriptions and sculptures upon it, the small fragments of ceramics and other minor objects, and by the written records left by the first Spanish missionaries, who obtained their information direct from the Indians themselves early in the days of the Conquest. The work of exploration and conservation was undertaken by the Archaeological Direction of the Secretariat of Public Education of the Mexican Government.

Photographs Nos. 1 and 2 disclose the condition of the pyramid before any

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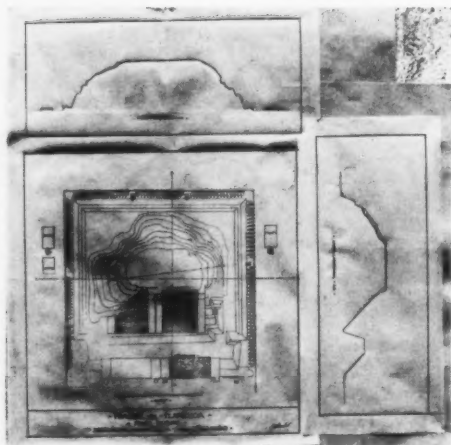


FIG. 3. SKETCH-PLAN OF THE PYRAMID OF TENAYUCA.

excavation had been attempted, and after the lapse of a year. It will be noted that the monument appeared much like a natural hill or mound; covered with scrubby vegetation, the

removal of which disclosed the exceedingly interesting monument we shall briefly describe in what follows. Reference to the sketch-plan (Fig. 3) will show exactly what the *débris* of ages had concealed.

The principal monument consists of a pyramid measuring more than forty metres on each side and rising to a height of rather more than fifteen at the present time. Originally the height must have been considerably greater, since no small part has been destroyed by the natives of the region, who pulled out the splendidly hewn stones to use in their own structures.

The stairway ascends the western face of the pyramid. It consists of a double set of treads and risers, separated by a dividing mass of low masonry called an *alfarda*, which is a characteristic element of Aztec architecture. It is interesting to observe that many of



FIG. 4. PRESENT CONDITION OF THE PYRAMID SEEN FROM THE NORTHWEST CORNER. NOTE THE RELIEFS ON THE PLATFORM OF THE SCULPTURED BOSSES.

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FIG. 5. THE COILED SERPENT BETWEEN THE TWO SMALL PLATFORMS OR ALTARS ON THE NORTH SIDE OF THE PYRAMID.

the steps have carvings representing different symbols. These were not, however, arranged in any order, which indicates that the particular stones were merely convenient material for construction filched from other, perhaps older, edifices. The most important and characteristic feature of the

monument is a narrow platform running about three sides of the exterior, on which repose stone serpents to the number of fifty-two on a side. These, like the carved stones of the steps, are of differing sizes and possess no symmetrical arrangement.

All this first construction conceals

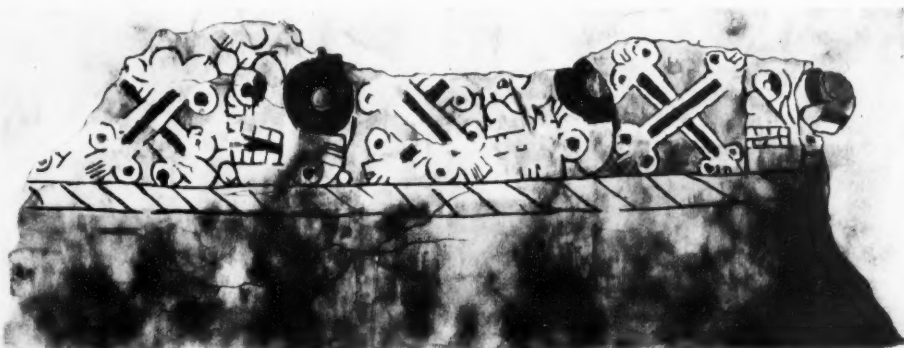


FIG. 6. FRESCOS FROM THE INTERIOR OF THE SMALL PLATFORM SITUATED AT THE FOOT OF THE EXTERIOR STAIRWAY IN THE SOUTHWEST CORNER. THE CROSSED BONES AND DECORATED SKULLS ARE PLAINLY DISCERNIBLE.



FIG. 7. ONE OF THE SMALL PLATFORMS WITH ITS SKULLS AND BONES SCULPTURED ON THE EXTERIOR. THE RAISED TRAP DOOR IS A MODERN DEVICE TO PROTECT THE FRESCOS OF THE INTERIOR.

another edifice of greater antiquity, of which there remains in almost perfect condition an interior stone stair. Here too the steps are carved, as on the exterior; but in this case there appears a certain symmetry, which makes it clear that we are dealing with either a superposition or that there may have been two different periods of construction. To both north and south of the pyramid, and at a distance of some eight metres from it, appear small platforms which may well represent altars, since before each we find beautiful coiled serpents which indicate points in space. The serpent on the north thus points to the northwest, while its companion on the south side indicates the southwest. It was been thought that this arrangement and orientation was

meant to convey the maximum separation of the points reached by the sun during winter and summer seasons.

Another important detail was the finding of a small platform at the foot of the masonry division of the exterior stairway. Within this we found a fresco representing crossed bones and human skulls richly ornamented. These same motives are repeated on the exterior walls or sides of the platform, but carved in stone instead of being in fresco.

Before concluding the excavation of the monument, it was considered essential to drive a tunnel through it, beginning on the east, to determine the number of interior structures there may have been and to ascertain the superpositions or amplifications of the edifice

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besides definitely attributing each to its proper local culture. Two ancient edifices, much older than the pyramid itself, were encountered within it, representing four distinct epochs of construction or superposition.

Thanks to the discovery of this pyramid, it has been possible to classify the chief architectonic characteristics of Aztec edifices. Don José Reygadas Vértiz, engineer, and Director of Archaeology, who conducted the excavations at Tenayuca, considers them briefly as follows:

- I. Taluses, or slopes of abrupt inclination.
- II. Decorative bosses or knobs upon the taluses, constituted of sculptured serpents.
- III. Narrow spaces upon the taluses, not meant to use as passage-ways or walks.
- IV. Stone stairways divided by double *alfardas* or low masonry partitions.

V. The central *alfardas* present two changes of pitch of a determined height in such a manner as to form a small landing-stage.

VI. Characteristic also of certain other cultures: superposition of two or more structures.

The importance of this discovery roots not alone in its architectonic significance, but also in the large number of small objects, especially ceramics, which invariably accompany this class of archaeological edifice, and which have served as a base for extended study. All the ceramic fragments were brought together and studied minutely. The resulting conclusions serve to corroborate much that history, as set down by the early missionaries, has told us with regard to Tenayuca.

We will not here enter into further details since a complete account of these ruins is being prepared which will take into consideration the architec-



FIG. 8. SPOT AT THE FOOT OF THE PYRAMID ON WHICH FUNERARY VASES OF ARTISTIC VALUE WERE ENCOUNTERED IN NUMBERS. THESE WERE MIXED WITH NUMEROUS HUMAN REMAINS.

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FIG. 9. FUNERARY VASE REPRESENTING EITHER A COYOTE OR A DOG, CONTAINING CALCINED HUMAN REMAINS. THE PICTURE IS A LITTLE LESS THAN HALF THE NATURAL SIZE WHICH WAS ROUGHLY THIRTEEN INCHES IN HEIGHT.

tonics, a description of the hieroglyphic signs, a study of the history involved, recopied from the early chroniclers, and a description of the ceramics. This work is almost finished and will be published before the end of the current year.

It is, however, possible to include in this short review those objects of most artistic value which were discovered at the foot of the platform which gives access to the exterior stairway. These, as will be seen by reference to Fig. 8, were found mixed with human bones inside of small cavities like sepulchres.

Fig. 9 is a most interesting example which, by its zöomorphic form and be-

cause in one sense it constitutes a novelty among Aztec ceramics, recalls similar specimens of Tarascan origin. The latter people manifested a distinct predilection for this class of figures. It represents a coyote, or perhaps a dog, in a seated position. The hind paws are very well executed, in contrast to the forepaws, which are scarcely more than indicated by light molding. The head is an interesting piece of realism. The snout is extended, as is proper with this class of carnivores, the mouth being left sufficiently open to show the teeth. The tongue lolls out between the two canines, which curve downward to meet the lower mandible. Instead of true ears, the figures carry two "earmuffs" or adornments, the left one being of the type known as *oyohualli*.



FIG. 10. SMALL CENSER OR INCENSE BURNER, WITH CHERRY-COLORED BASE, PERFORATED DECORATION AND EAGLES' HEAD SUPPORTS WHICH ALSO SERVE THE PURPOSE OF RATTLES.



FIG. 11. SMALL POTTERY BOWL CARRYING SYMBOLIC DECORATION (SLIGHTLY LESS THAN NATURAL SIZE).

From the posterior part of the top of the head opens the receiving aperture for the human ashes, the edges being extended and prolonged toward the rear. The oblique configuration of the eyes is another realistic detail which gives the animal an almost human expression. The quality of the clay of which the figure is made, could not be bettered; it is cannily worked and is the color of coffee.

Another funerary vase (Fig. 10) is a most beautiful example of a perfumer or incense-burner, made of the finest clay, perfectly worked on the outside of a cherry-colored base or slip. The triple supports of its base are decorated in deep incised reliefs which show eagles' heads and which also serve as rattles. The globular body of the censer carries decoration which we may call lace or open

work. It extends through the entire thickness of the wall and makes circles, each two of which are perforated while the intermediate ones are in relief only, this being necessary for the solidity of the vase. The neck is almost horizontal, forming an acute angle with the body and the lip flares widely. The interior is neither well finished nor painted, and contained no calcined remains. The censer stands $8\frac{1}{2}$ cms. high.

Finally, in Fig. 11 we have a curious drinking bowl of small size, of interest chiefly because of its elaborate symbolic decoration. This same class of motives is to be found in other representations, which indubitably signifies some relation with the cult of the region and the religious beliefs of the people who constructed this monument.



ثم بعد ذلك بطلب من امرئ الذي ينادي في الاقليم ابشر وابشرون امواكم
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وحسن ما ابشر وايقظوا العلماء بالارتقاء وايقظوا بقدور الملك الاعظم
وايقظوا الي ويدا الحجر العظيم فقلت من انشائها الملك فقال انا الروح
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الاقليم بالشري وكان ذلك في العشر الاوسط من شري تعبروا الي البيوت
فذهب عنهم الحزن والهم مغرور فبينما هم بالشري مسرورين هاتوا له الملك
مجهزون فاذا بملك من الحجر قد صعد ثم تريا على مثل صورة اخر له جسد واحد
براسين ويطير بجذبه جسد انسان صورة ملك راسه فيان وله ياد ورجلان
وهو حارس السطح وفيه من كل لون وقدره دابره واليد ابصر ودابره
احمر وتحتها نار حمر وتحت الارض

ARABIC ALCHEMIST'S "OVEN."

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ANOTHER PAGE FROM ARABIC MANUSCRIPT.

CHEMISTRY IN ANCIENT PERSIA

By E. J. HOLMYARD

THE systematic use of chemistry as an aid to medicine began, in Europe, with that "fitful, strange, and moody" spirit Philippus Theophrastus Aureolus Bombastes Paracelsus von Hohenheim (1493-1541), who proclaimed himself the legitimate monarch of medicine, and assured the citizens of Basle that all universities, all writers put together, were less gifted than the hairs of his beard and of the crown of his head.* In spite of his arrogance and love of mystifying his fellows—for

"Bumbastus kept a devil's bird
Shut in the pommel of his sword,
That taught him all the cunning pranks
Of past and future mountebanks"—

Paracelsus performed the great service of drawing the attention of many chemists away from the phantasms of alchemy and directing it to the preparation and purification of drugs for use in medicine. He thus inaugurated the study of medical chemistry, or iatrochemistry, which formed the major portion of the science until the time of Boyle, and is still represented by our pharmacology and pharmaceutical chemistry.

Medicine and chemistry were, however, closely associated in still earlier times. Several chemists of Islam were physicians by profession, their interest in chemistry arising from the necessity they found of preparing their own drugs, or from their amateur researches in quest of the philosopher's stone. Conspicuous among these Muslim chemical physicians stands the great figure of Rhazes, who, though he dif-

fered from Bombastes as widely as possible in temperament and character, may well be called the Paracelsus of Persia, since he taught and practiced the study of chemistry as a valuable aid to medicine.

During the last few years, several important researches have been carried out upon his life and work—in England by Colonel G. S. A. Ranking and the late Professor E. G. Browne, in Germany by Professor J. Ruska, and in India by Principal H. E. Stapleton of Calcutta—and we can now form a reasonably clear picture of the man and his achievements.

Abu Bakr Muhammad ibn Zakariyya al-Razi was born in 865 A.D. at the ancient town of Ray, the principal city of the northeast part of the Jibal province of Persia. It is from his birth at Ray that he was known as al-Razi, or "the man of Ray", a name which in Latin Europe underwent a modification into Rhazes, Rhases or Rhasis. In his early youth he gave his time to the study of music (upon which he wrote an encyclopaedic work), of philosophy and of logic. He sang well and became a skilful player upon the lute, but abandoned these accomplishments in after years on the grounds that music "proceeding from between moustaches and a beard" was seriously lacking in charm. As to philosophy, we are told that he did not fathom it, "nor apprehend its ultimate aim, so that his judgment was troubled and he adopted indefensible views, espoused heterodox doctrines, and criticized people whom he did not understand, and whose methods he did not follow".

* Paracelsus is usually portrayed as bald and clean shaven!

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In his early thirties, he journeyed to Baghdad, where he heard of a wonderful cure that had just been effected at the Old Hospital, situated on the right branch of a canal in a suburb of the town known as Karkh. His interest thus aroused, he paid several visits to the Hospital, asking questions and taking notes, until in the end he decided to devote his life to the study of medicine. Muslim humor has provided us with an alternative story of the way in which he was led to this decision. Having already become fascinated by alchemy, the tale goes, Rhazes was one day carrying out certain experiments in the course of which he accidentally inhaled some poisonous fumes. Upon going to a physician to be cured he was amazed to be presented with a bill for £250. "I perceive," he said, "that here is the true art of alchemy or gold-making", and forthwith entered upon his medical training. Of this story, all that need be said is that our knowledge of Rhazes' character is sufficient to acquit him completely of any mercenary motive.

Returning to his native town, Rhazes became a regular visitor to the local hospital, the dispenser at which was one of his personal friends. His diligence and intelligence were such that he soon surpassed his teachers, and after a short time he was appointed superintendent and chief physician at the Ray hospital. In addition to the heavy duties which these posts entailed, Rhazes had also to undertake the training of the medical students. In Muslim fashion, the master sat on the ground in the great, cool, paved courtyard, with his pupils around him. In the innermost ring were the seniors, while the juniors sat beyond in an outer ring. When a patient came for treatment, he had first to describe his symptoms to the elementary students. If

the latter understood the case, they prescribed for it, but if not, the patient was passed on to the "second year men". One may assume that there was very little beyond the power of these young men, but if even they had to confess that they were baffled, Rhazes took the case in hand himself.

Such was the fame of Rhazes as an administrator and as a physician that, sometime during the reign of the Caliph Al-Muktafi (902-7 A.D.), he was offered, and accepted, the post of director and chief physician at the Hospital at Baghdad. How long he held this office we do not know, but he seems to have travelled a great deal, attending the Persian nobility and even Caliphs themselves. He always preferred Persia to Iraq, because it was his native country and his family still lived there. Towards the end of his life, he became blind, through his refusal to be operated on for cataract. His friends urged him to have recourse to a surgeon, but he steadfastly declined, remarking that he had already seen so much of the world that he was wearied of it. The occasion of the cataract, if we are to believe the testimony of another celebrated physician, Ibn Juljul, was an injury inflicted upon him by Al-Mansur, governor of Ray. Rhazes had written a book to establish the truth of the possibility of transmuting the base metals into gold, and travelled from Baghdad to Ray to present the book to Al-Mansur. The governor expressed his gratification, made Rhazes a handsome gift of £500—and ordered him to demonstrate an actual transmutation! Rhazes did his best, after vain attempts to evade the issue, but all to no purpose. Mansur then summoned him to his presence, and, having gravely reproached him for including deliberate falsehood in what purported to be a

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scientific treatise, struck him on the head with a whip. Cataract set in shortly afterwards, and finally Rhazes became totally blind. Of this story again we can say with no little confidence that, whatever the facts of the case, Rhazes at least was not guilty of wilful deceit of others, though he may have deceived himself.

Rhazes died in his native town on October 26th, 925 A.D., at the age of sixty years and two months. He is described as having been of a liberal and generous nature, courteous and affable to everyone, and exceedingly kind to the poor, upon whom he bestowed bountiful allowances and gratuitous medical attendance. The ablest physician of his age, Rhazes was a keen student of earlier authorities; "his chief anxiety and care was to study what the most famous learned men, such as Hippocrates and Galen, had written in their works, so that he made himself master of such knowledge as falls to the lot of very few physicians". When not actively engaged in his practical or administrative business, he was continually reading, copying, or writing, and no doubt this excessive devotion to study was a contributory cause of his blindness.

The Muslim physicians were expert in the art of psychotherapy, and a story told of Rhazes in this connection is amusing enough to be related here: A certain Emir was incapacitated with severe rheumatism, which his own medical attendants were unable to cure. He therefore summoned Rhazes, who, after several methods of treatment had failed, finally said that he would try a new treatment but that it would cost the Emir his best horse and his best mule. The terms were accepted and the horse and mule were handed over to Rhazes, who thereupon took the

Emir to a "Turkish" bath outside the city and went into the hot room with him. After a suitable time had elapsed during which draughts and douches were administered to the patient, Rhazes went out, dressed, and returned with a knife in his hand. The startled Emir was amazed to hear a torrent of abuse pouring from the lips of the eminent physician, but when Rhazes at length brought matters to a climax by



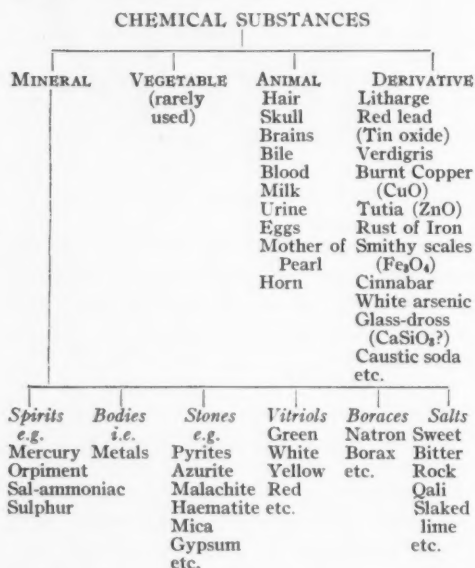
AN EARLY CHEMICAL DIAGRAM.

threatening to kill him, the Emir's fear and anger knew no bounds. He sprang to his feet in order to summon the guard—forgetting all about his rheumatism—but Rhazes had fled to the outer door of the bath, where his servant was waiting with horse and mules. They did not stay their flight until they were over the frontier. Rhazes afterwards wrote and explained that his provocative words and acts were designed as a part of the treatment, and the Emir, who had indeed completely shaken off his pains, had grace enough to see the humor of the situation. He rewarded his ingenious

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healer with many rich presents and assigned him a yearly pension of £1,000 and two hundred ass-loads of corn.

Rhazes is of exceptional importance in the history of chemistry, since in his books "we find for the first time a systematic classification of carefully observed and verified facts regarding chemical substances, reactions and apparatus, described in language almost entirely free from the usual alchemical mysticism and ambiguity". While he perhaps never attained to the genius of his great predecessor Geber—of whom he always speaks with admiration and reverence—his clear and orderly habit of thought and expression made his work easily intelligible and of permanent value. His scheme of classification of the substances used in chemistry shows a sound chemical insight. It is as follows:



Rhazes gives also a list of the apparatus used in chemistry. This consists of two classes—instruments used for melt-

ing metals, and those used for the manipulation of substances generally. In the first class were included a blacksmith's hearth, crucible, descensory, tongs, and a semi-cylindrical iron mould, while the second class included:

Cucurbite	Water-bath
Alembic	Large oven
Receiving flask	Hair-cloth
Aludel	Filter of linen
Beakers	Cylindrical stove
Glass Cups	Potter's kiln
Shallow iron pan	Chafing-dish
Sieve	Mortar
Heating-lamps	Flat stone mortar
Flasks	Stone roller
Vials	Round mould
Cauldron	Glass funnel
Sand-bath	Dish

It will be observed that the list was comprehensive, but Rhazes completes the subject by giving details of making composite pieces of apparatus, and in general provides the same kind of information as is to be found nowadays in manuals of laboratory arts.

Like Geber, Rhazes was a firm believer in the possibility of transmutation, and Stapleton describes his scheme of procedure approximately as follows. The first stage consisted in the cleansing and purification of the substances employed, by means of distillation, calcination, amalgamation, sublimation and other processes. Having freed the crude materials from their impurities, the next step was to reduce them to an easily fusible condition. This was done by an operation known as *ceration*, which resulted in a product which readily melted, without any evolution of fumes, when dropped upon a heated metal plate.

The next step was to bring the "cerated" products to a further state of disintegration by the process of solution. The solutions of different substances, suitably chosen in proportion to the amount of "bodies", "spirits", etc., they were supposed to possess,

ART AND ARCHAEOLOGY

were brought together by the process of combination. Finally the combined solutions underwent the process of coagulation or solidification, the product which it was hoped would result being the Elixir. This, as is generally known, was a substance of which a small quantity, when projected upon a larger quantity of baser metal, would convert the latter into silver or gold.



SYMBOLIC REPRESENTATION OF ALCHEMIST'S PROCESS.

From a general study of his chemical works, Stapleton says that henceforward Rhazes must be accepted as one of the most remarkable seekers after knowledge that the world has ever seen—not only “unique in his age and unequalled in his time”, but without a peer until modern science began to dawn in Europe with Galileo and Robert Boyle. The evidence of his passion for objective truth that is furnished by his chemical writings, as well as the genius shown by the wide range of books he wrote on other subjects, force us to the conclusion that—

with the possible exception of his acknowledged master, Geber—Rhazes was the most noteworthy intellectual follower of the Greek philosophers of the seventh to fourth centuries B.C. that mankind produced for nineteen hundred years after the death of Aristotle.

Of Rhazes' numerous books and monographs on medical subjects this is not the place to speak, but it may be mentioned that he wrote a celebrated treatise on small-pox and measles, which “on every hand and with justice is regarded as an ornament to the medical literature of the Arabs”. His most important text-book of medicine was called the *Hawi* or *Continens*, which has never been published in the original and of which no complete manuscript exists. Even in the tenth century, the famous physician known to the West as Haly Abbas (Ali ibn al-Abbas), could discover only two complete copies. In its Latin dress, the *Continens* was published as early as 1486, at Brescia, and formed one of the chief handbooks of early European medicine.

In spite of his great attainments, Rhazes was a modest man, as the following anecdote may serve to show. When walking with a party of his pupils one day, Rhazes met a madman. Now the madman would gaze at none of the pupils, but only at the master himself. Upon returning to his house, Rhazes ordered them to prepare for him a decoction of dodder, which Dioscorides recommends as a cure for mental diseases, and much to everyone's surprise, when it was ready he drank it. His pupils enquired why he drank it, to which question he replied that as the madman had gazed and smiled upon him, he must have perceived in him some trace of his own madness, for “birds of a feather flock together”.



ANATOMY LESSON, PROFESSOR NICOLAES PIETERSZ TULP DEMONSTRATING. BY REMBRANDT.

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THE WINDMILL. BY A. CUIJP.

A SHORT VIEW OF DUTCH ART

By W. J. STEENHOFF

Translated from the Dutch by Paul Paleux

A DUTCH proverb says, "One's own hearth is worth its weight in gold," and it contains pithy truth; how surely and honestly the sincere feeling of the intimate, domestic life is here welded together with the most prosaic and matter-of-fact views. In this country there are all kinds of outside influence, placing feeling before finish, developing detail strongly, and moreover bringing into its atmosphere a strong, foreign-derived refinement of color blendings. It is therefore natural

that painters should be born here with a feeling for tonality and an intense desire to depict life from the intimate side. This practical and matter-of-fact folk finds its prosaic state of existence to be its dream of happiness.

Here in this country, interest centers not only in the early art of the period about 1400, but also in some which is of the type valued because of its relation to the so-called Primitives, though not belonging to such an early date and not of course possessing such a high value.

ART AND ARCHAEOLOGY

Now, it is said to have been perceived, that the works of the Primitives are the product of a clear design and careful work. In fact, this early art is stronger in *leit motif*, while the landscape is subordinate; all the great attention to detail is to be found here: a dish, a bun, apples, etc. In the beginning of the development of Dutch art two nations

were linked together which are now reckoned separately: Belgium and Holland. In the XVth century, however, they fell apart from racial dissensions, so that it is no longer possible to speak of them as one country, yet there is much in common

between the constituents of Haarlem, Leyden or Bruges, Ghent and Louvain. One can perhaps best point out the difference between the North and South Dutch art, with the brothers van Eijck, Rogier van der Weijden, Hugo van de Goes, Direk Bouts and Hans Memling standing for Flanders and Albert van Ouwater and Geertgen van St. Jans, at Haarlem, for Holland. Thereby it will be noticed that diverse

and interesting painters working in Flanders, and later, also, Peter Brueghel and Jerome Bosch, were born in the North Netherlands. Up to a time late in the XVIth century, there is still to be found a mingling of racial characteristics among the painters of the North and the South. A significant splitting can first be distinguished

about 1500 with Quentin Massijs in Antwerp and Lucas van Leyden, in Leyden, while, at the top point of the development, Rubens and Rembrandt expressed the basic difference between the two races. The Reformation made many contributions



THE VISIT. BY GERARD TER BORCH.

toward the separation between North and South Dutch conditions, and it is remarkable that the introverted Rembrandt whose art is so deeply moving as a display of life's mysteries, remains more closely bound to the spirit of the Primitives, than Rubens, the Catholic, whose characteristic is coloristic luster and excessive exuberance of form. The entire Dutch school of painting distinguishes itself, altogether independently

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GOSSIP. BY BREKELENKAM.



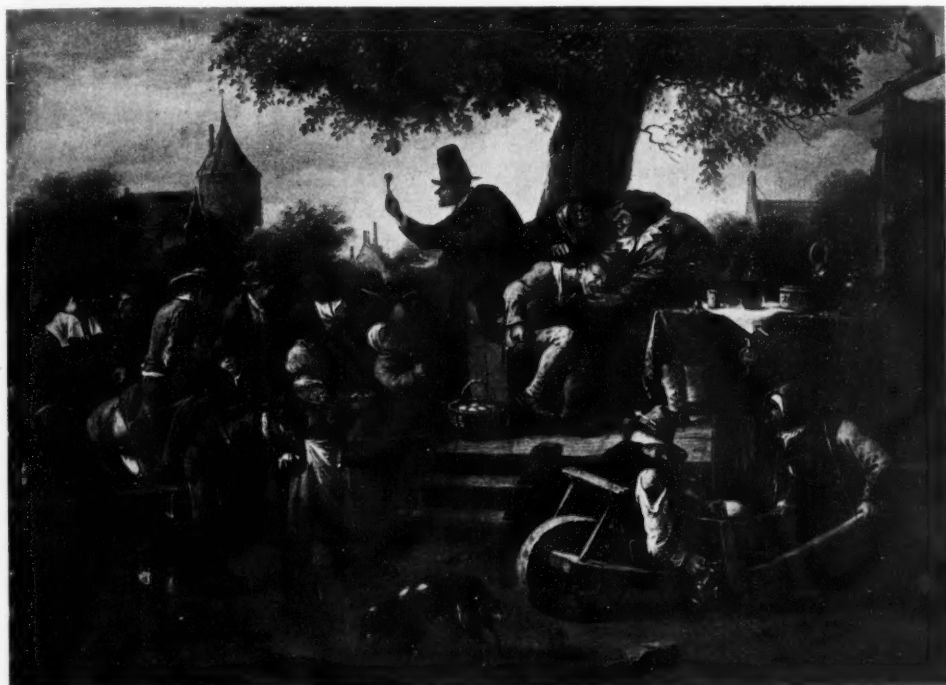
THE LETTER. BY J. STEEN.

ART AND ARCHAEOLOGY

of the Flemish, by a development of the spirit of intimacy and actuality, and by the subdued color tones. The Flemings developed more upon the lines of foreignness and colorfulness.

At the end of the XVth century, there begins to be observable Italian

represented, with such others as Mabuse, that art which exerts its strength in outward style and luxurious showiness, together with absence of inner quality. There one can see the first sign of academic dogmas which, always following the example of the Italians,



THE MAGIC DOCTOR. BY JAN STEEN.

influences among the painter's artists in Holland. A real agitation carried the fame of the Italian works of art into the art circle of North Holland. The entrance into the South gradually gathered more impetus. In the first half of the XVIth century, it was, above all others, Jan van Scorel who introduced into the examples of his art, following the precepts of the Italian masters, here in Holland, new forms of beauty, and other painter's lore. He

is carried forward in the art of Van Heemskerck, Cornelius van Haarlem and Goltzius.

At first, after the separation between North and South Dutch art, there fell upon the separated Dutch painters also, the influence which came from German sources, and which had to be taken into consideration, and then worked most strongly upon Corn. Engelbrecht, the greatest fantasist among the Hollanders. His pupil, Lucas



THE CALLER. BY P. DE HOOCH.



TWO HOUSES: HOLLAND.



LANDSCAPE WITH WATERMILLS. BY MEINDERT HOBBEEMA.

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ART AND ARCHAEOLOGY

van Leyden, had as an engraver the very famous Albrecht Dürer, to take as his example. His engraving work is much more plentiful than the products of his brush; but he is also to be considered, for his fine sense of color- and tone-ratio, as the first important, purely Dutch painter.

Distinctive of the naturalistic disposition of Dutch painting, is the fact that it has always made itself free from foreign influences in its portraiture. The so-called "corporation picture", a collection of portraits of guilds, has had a specific genre from the XVIth century, with Scorel, up to the XVIIIth century with Troost. As predecessors of Rem-

brandt, Frans Hals, and van der Helst, there are to be named, in chronological order, Direk Barentsz, Ketel, Mierevelt, Elias van Ravesteyn, Moseelse, van de Voort, de Keijzer—who was active in Amsterdam—and finally Rembrandt. Around this great master of the portrait group there were many and numerous pupils—as Casel Fabritius (the most important), Nicolaes Maes, Govert Flinck, Ferdinand Bol, Direk Santvoort. The names of the Dutch painters who have excelled in portraiture are too numerous to mention. If we omit Rembrandts which are genuine, then Frans Hals, with his elegant, bold, painter-like style, will



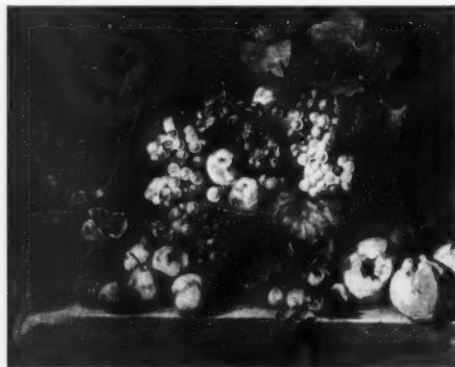
LANDSCAPE WITH TWO TREES. BY JAN VAN GOYEN.



SKATING IN HOLLAND. BY A. ARENTSZ.

sparkle above all the others. However, it is remarkable that before the relapsing of artistic life in the XVIIIth and in the first half of the XIXth centuries, his genius was only recognized and suitably rewarded in later times. In the Haarlem museum he is the most brilliantly represented. The characteristic feature in the nature of the Dutch painters, which manifests itself in their inclination toward representations of things taken from daily life, and all things in their natural surroundings with deep thought and sharp attention, making them clear, also comes to expression most emphatically in still life. In the first half of the XVIth century, there begins in the kitchen pieces of Pieter Aertsz (half-Fleming, half-Hollander) the first sign of still life as a separate genre, which was fated to develop until in the

XVIIth century it had attained full bloom. The technical ability obtained from abroad by the Dutch painters here entered most strongly into the light. At first painted in a gray tone by such masters as Heda, Pieter Claesz, Jan van de Velde, still life be-



FRUIT. BY PIETER SNIJERS.

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others, due to his style. He is the classic example to be named among the Hollanders.

Landscape came first to its full development, after the initial influence of Flemings such as Coninseloo had ceased to act. This is first observable by the case of Esayas van de Velde, who was the instructor of Jan van Goyen. The landscape was first presented as truly Dutch by Overcamp and Arent Arentz, also by van de Venne. Then there developed the sense for atmospheric realism in the landscape, which found its highest expression in the art of Jan van Goyen, Jacob and Solomon van Ruysdael, Hobbema, Isaac van Ostade, van Everdingen, Albert Cuyp, Antonius van der Neer, and others. Hercules Segers with his etchings takes a special place, while, among the painters of animals, Paulus Potter excels by noble (clear) drawing. Characteristic for the landscape of the Dutch painters, is a low horizon and a high cerulean field, with the lively play of light on the clouds. Many interior-painters and figure-painters also did landscapes, among which the most prominent to be considered is Rembrandt.

Among the marine-painters there is a corresponding development in atmospheric expression. In the heyday of this art, there are chiefly to be enumerated Willem van de Velde, Dubbels, de Vlieger and van de Capelle. Among the animal painters there is Potter. Wouwerman is the best known as a horse-painter, while in city views, Jan van der Heijde and Berckheyde excel. Among the painters of church interiors there are chiefly to be mentioned Saensdam and with this latter, Emanuel de Witte, Haeckgeest, and van Vliet.

In the golden XVIIth century there could be named more members of this

group as representatives of the various genres. This number is too considerable to be set forth in full. But all are dominated, each in his own genre, by the figure of Rembrandt.

The qualities of intimacy and natural truthfulness of representation make the Dutch paintings, which mostly have



THE QUARREL. BY A. BROUWER.

everyday life for their subject matter, exert a wonderful fascination and charm. But in the art of Rembrandt, essentially of the same characteristics, the expression takes on a deeper and more tragic nature, the path to the sublime. The prime of its maturity began as far back as the time of the nationalistic separation and kept itself alive and in full strength until just before Rembrandt's death in 1669. He himself reached the level of and was imitated by many painters in Flemish and

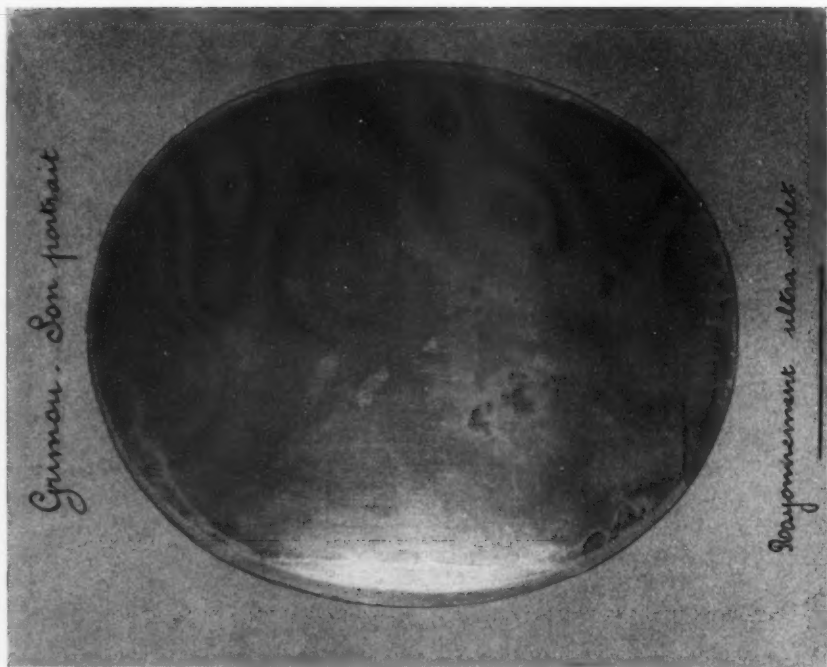
(Concluded on Page 43)



Grimou - Son portrait

Photographie en lumière blanche

A PHOTOGRAPH OF AN XVIIITH CENTURY PORTRAIT TAKEN IN ORDINARY LIGHT.



Grimou - Son portrait

Soyonnement ultra violet

THE SAME PHOTOGRAPH UNDER ULTRA-VIOLET RAYS. EVIDENCES OF RETOUCHING ARE CLEARLY SEEN ON THE RIGHT OF THE HEAD, THE WAISTCOAT, THE SLEEVE AND AT THE BOTTOM RIGHT-HAND CORNER OF THE PICTURE.

THE EXAMINATION OF DOCUMENTS AND PAINTINGS

By LEONARD V. DODDS

HISTORICAL research has benefited considerably from recent developments in knowledge of light. So much so that the application of modern methods has resulted in the discovery of new material from old sources, much of which has been unavailable hitherto.

The most outstanding success has been gained in deciphering palimpsests, and scholars who have been engaged on this study consider that there is wide scope for research which may yield results of outstanding historical importance.

Consideration of the properties of light has enabled the various parts of the spectrum to be studied closely, and study of the ultra-violet region has yielded especially valuable results. These rays possess the power of exciting fluorescence in various substances susceptible to their action, and this property has been applied in an amazing number of ways in industry, in technical research and also in historical affairs.

Many dyes are among the substances which exhibit fluorescence on exposure to ultra-violet, and this property has now enabled writings erased hundreds and probably thousands of years to be not only read clearly but to be photographed also.

In olden days, when parchment was used for writing upon, it was not destroyed when time had rendered the document worthless. Instead it was carefully cleaned by mechanical or chemical means and then used a second and even a third time. In spite of the most thorough cleaning some of the

original tints and dyes were usually left in the parchment, and by the medium of ultra-violet rays it is possible to read the erased writing, even though the visible text has utterly vanished and another has been superimposed.

When a beam of ultra-violet strikes a substance capable of fluorescing, the invisible rays are changed into visible light of longer wave-length, and the curious glow is seen to which the term fluorescence has been applied. This glow varies in color according to the substance illuminated, and in many cases the actual substance itself can be determined by its characteristic fluorescence. This particular property is not of great historical importance, but illustrates one strange way in which these rays can be used, and it is one, moreover, which has now achieved a definite place in industry.

For deciphering palimpsests, a lamp generating ultra-violet rays by the mercury-vapor method is the one most frequently used, and the analytic lamp is probably the most convenient type. In this instrument the burner is contained in a box-like structure which affords a chamber for examination. A camera lens can be inserted so that permanent photographic records may be obtained with facility. Suitable filters enable the visible text to be eliminated, or when more than one palimpsest is present, each may be illuminated separately, thus affording opportunity both for photographs and study.

This method was first devised by Professor G. R. Kögel, of Vienna, who used elaborate apparatus and tech-

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nique. Later research has now enabled more simplified methods to be employed. While the filters are of much value, it is probably of even greater interest to see the palimpsest beneath the superimposed and visible text. Very often this runs transversely to the later writings, which tends to clearness. Though there are various imperfections in the script, due to variations in the cleaning processes used on the parchment, it is seldom that any difficulty occurs due to visibility.

In a photograph showing these two texts, the visible writing appears as if written in outline type—that is, white letters with a narrow black edge—and underneath at right angles can be seen quite clearly the dark grey letters of the older script.

Professor Kögel has taken excellent photographs of part of Folio 193 of the Codex Sangallensis or Codex Δ which is of great interest. This Codex contains the Gospels in Greek, wanting only John XIX, 17–35. It is written on 197 vellum leaves, each measuring $8\frac{7}{8}$ inches by $7\frac{1}{8}$ inches, and is complete with prologues, Eusebian Canons and tables. In all probability this manuscript was written in the monastery of St. Gall in the IXth or Xth century. It is said that the script was by one who did not know the language and who had little practice in forming the characters, for the Greek letters are small semi-uncials of western type while the Latin is in miniscules of Irish type. Formerly the Codex Sangallensis contained also the Pauline Epistles, but these are now separate and form the Codex Boenerianus of the Royal Library at Dresden.

It is an extraordinary development of science which thus enables writings erased so long ago to be read again,

and while the ability to photograph the fluorescences makes a permanent record ready for immediate reference, testing with ultra-violet rays has the great advantage over other methods using chemicals, which might be employed for similar purposes, in that no damage is caused to the existing writings. As it has been possible to photograph a palimpsest on this manuscript it is probable that attention may eventually be given to similar writings. The Codex Paulinus at Würzburg, which contains the thirteen epistles of St. Paul and the Epistle to the Hebrews, or the Codex Ambrosianus, formerly at Bobbio, now at Milan, may possibly yield new matter of much interest. As yet sufficient work has not been accomplished to complete the translation of the palimpsest, but the investigations will be continued eagerly. Comparatively little work has been done on this subject, but it is one which affords endless possibilities.

Thanks to the kindness of an American professor, the authorities at the British Museum, under the direction of Mr. Idris Bell, Keeper of Mss., have recently been able to install a lamp for the examination of Mss. The early attempts were not conclusive and could not be considered satisfactory, but the experts believe that future work will prove the efficiency of the apparatus and may yield matter of much historical value.

In Paris, this method is being studied by Dr. Cellerier, Director of the Musée du Louvre, and various rays, ultra-violet, Röntgen and others are being used to examine paintings and manuscripts. The work at the Louvre is naturally more concerned with pictures than with documents, and most of the work has been directed toward this end. Extremely successful results have at-



ART AND ARCHAEOLOGY

tended the researches of Dr. Cellerier and his colleagues, and many pictures have been identified with certainty as the work of a particular artist. Of course there are other methods which can be used with probably equal success, but the ultra-violet rays are advantageous in that again no damage is caused to the paintings and that the method of working is comparatively simple and convenient. It is interesting and somewhat humorous to note that one result of the Director's work is that one or two minor paintings in the Louvre which were carefully treasured as originals have now been proved to be copies by a lesser known brush.

While this means of testing pictures is undoubtedly important, it does not comprise the principal use of ultra-violet rays in the study of paintings. By examination under this light the actual method of working used by the artist is disclosed. His varying brush strokes show clearly and it is to this aspect more particularly that Dr. Cellerier and his colleagues have given special consideration in order to find, if possible, the technique by which some of the old masters achieved their magnificent effects.

Considerable developments have taken place recently in the application of this process to the examination of modern documents. In criminological work and in philately the most outstanding successes have been gained, and while the results are important, the methods are of considerable interest.

In the case of a complete forgery, as of a check or treasury note, the difference between the genuine note and the forgery is strikingly apparent when seen under ultra-violet radiation. If a document has been altered so that erasure is quite unnoticeable, and it is

placed under filtered ultra-violet, the alteration will show clearly.

In a recent case, a letter of credit was obtained in Japan for a moderate amount, and confirmed by first draft made in that country. The document was then posted to Europe, where all important entries were chemically erased and substituted by different dates and a greatly increased amount. On the falsified document £1,000 were drawn on the Munich branch of the Deutsche Bank on July 26th, 1928. The date was altered to July 6th, 1928, and the fraud was only discovered when the document was presented at Nürnberg on 27th of July.

To the eye of the cashier the document was perfectly in order, but under the ultra-violet rays, the erased writing can be seen clearly. In a photograph this does not show so well because the colors of the fluorescent light, which are brilliant to the eye, appear only as tones of grey in a photograph, yet even this is sufficient to make the alterations clearly discernible.

Similar alterations are made to postage stamps, and though on first thought this matter may not appear important, it must be remembered that some stamps are exceedingly valuable and cost hundreds of pounds. The art of faking has been developed with conspicuous success in recent years, so much so that repairs to stamps often defy all ordinary methods of detection.

But the secret of fraud is yielded at once beneath the ultra-violet rays and most of the large collectors and important dealers are now using the method with success. Again, the great advantage is that no injury is done to the specimen. This is important because if a suspected stamp was damaged under the test by chemical or other action, and yet was proved to be

ART AND ARCHAEOLOGY

genuine, as has happened on more than one occasion when ordinary methods were used, the loss entailed was considerable.

The ways in which these rays can be applied have by no means been exhausted and the possibility of examining ceramics similarly has recently been suggested. This offers very interesting possibilities; as yet it is a comparatively virgin field. Dr. Cellerier in Paris has done a small amount of research on the matter and intends to go further very shortly. Apart from this hardly anything is known on this subject.

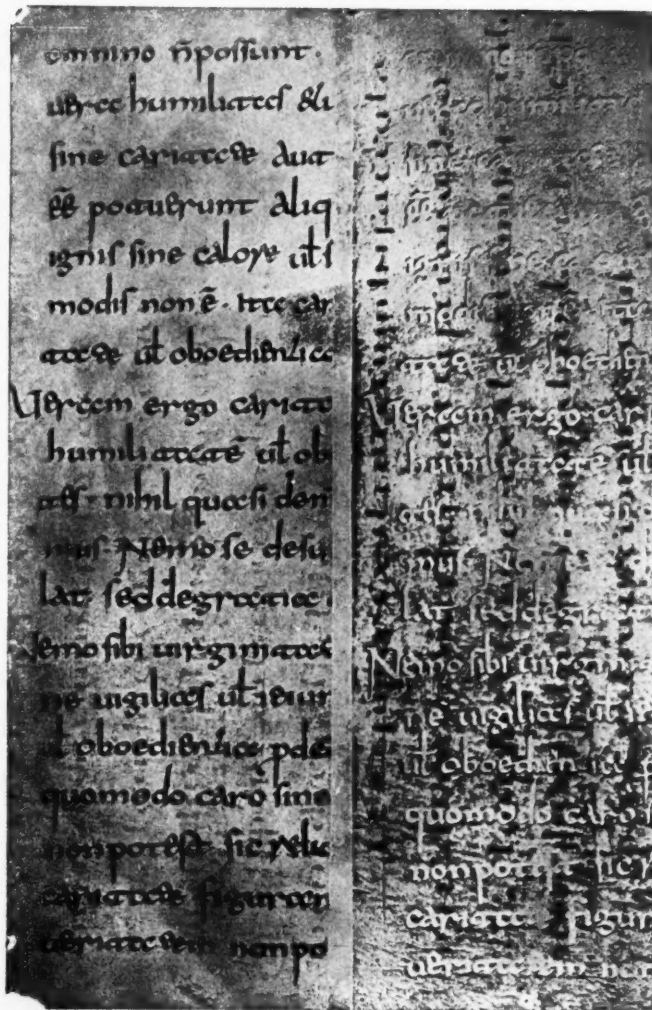
The whole field of examination under ultra-violet has remarkable and fascinating possibilities, yet it has also many difficulties which must be surmounted.

The Wood filter which limits the spectrum of the ultra-violet lamp to that required for examination purposes (ultra-violet only, absorbing infra-red, visible and other radiations) has now been superseded by a more simple filter of uviol—blue glass—almost black in color, which is extremely satisfactory. Also lamps themselves have been improved very considerably and advanced methods of spectrum-meas-

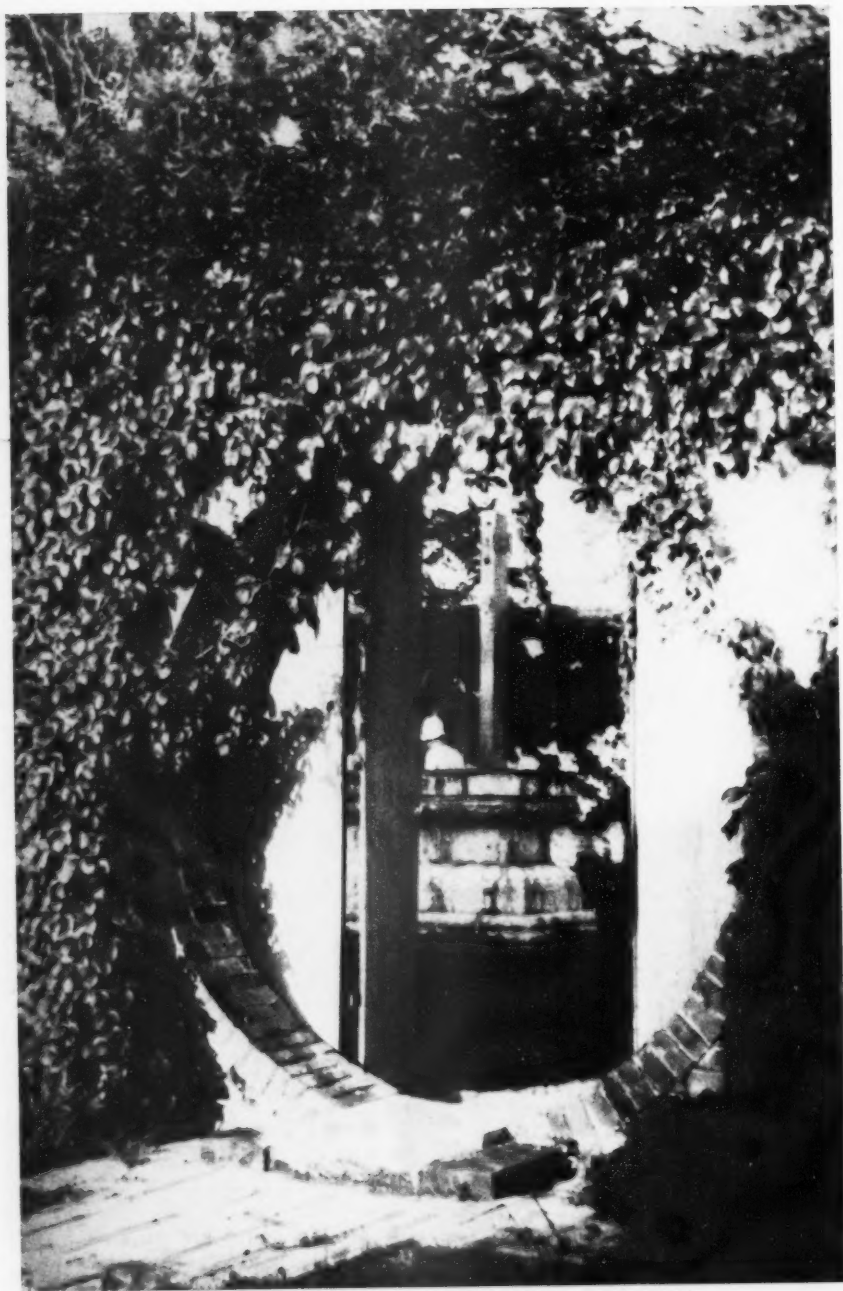
urements enable better calculations to be made.

All these factors are of considerable importance in developing this work, but as yet there are quite a number of substances which do not show any

(Concluded on Page 52)



ON THE LEFT IS SEEN THE MANUSCRIPT PHOTOGRAPHED IN ORDINARY LIGHT. ON THE RIGHT ULTRA-VIOLET RADIATION WAS THE ILLUMINANT AND THE OLDER SCRIPT IS CLEARLY SEEN. BY COURTESY OF PROF. G. R. KOEGL.



MOON GATE IN WALL OF OBSERVATORY, PEIPING.

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THE ASTRONOMICAL OBSERVATORY IN PEKING

觀象台

(Kuang Hsiang Tai)

By FLORENCE B. ROBINSON

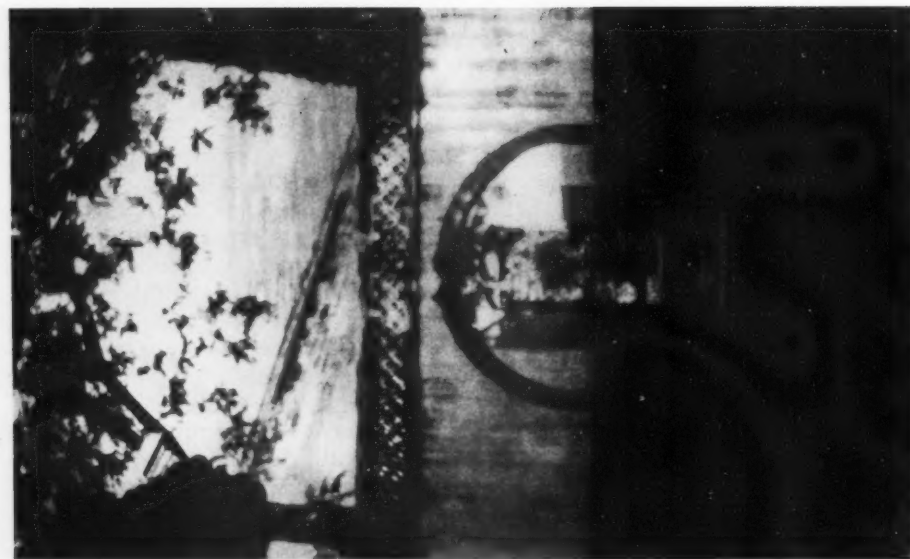
PEIPING! Peking! The city of dreams and romance, the climax of desire—full of untold charms and unsung beauties, rich beyond the dreams of avarice, poor as the veriest beggar of her streets, overflowing with all that strange mysticism of the East which the West can never understand because it tries to penetrate the non-existent.

Since time immemorial astrology and astronomy have been known and practised in China, but rather for fortune-telling than as an exact science. Portents and omens have been foretold from the stars, and all mundane affairs have been more or less regulated by their direction. Social events, family affairs, business and politics, all have been directed and influenced by the constellations, their movements and their juxtapositions. And so one would naturally expect to find in this capital of the land of Kublai Khan and Genghiz Khan, an astronomical observatory of considerable interest even had we not heard of it in connection with international affairs.

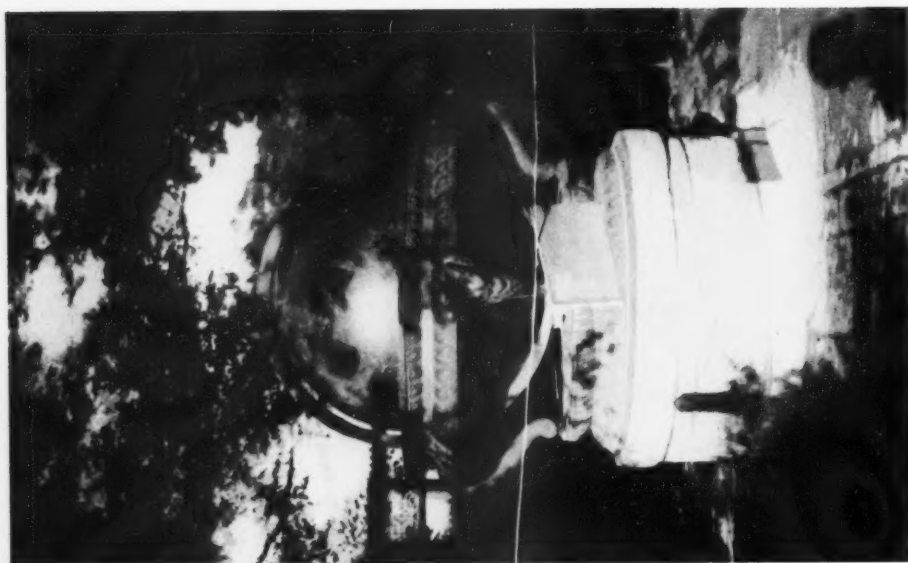
Passing down Hatamen street to the Great Gate in the city walls, one turns off and follows the wall eastward to an ancient pavilion, next to the site of the old examination halls. One arrives at an ordinary gate in a brick and plaster wall, tile-coped, heavy and massive. A porter answers the signal and demands a fee, after which one may wander freely about. This outer gate opens into

a large, square, rather barren area, bisected by a path. A sort of hedge of kochia, or summer cypress, borders this path and to the right of it are a number of wooden structures housing modern instruments, such as may be seen anywhere in America. These are set quite regularly, as if they were the accents of a formal pattern which no longer exists or has never more than begun.

A small building flanked by walls on either side encloses the far end of this area and through a gate in one of these walls, we enter a second court. This court has an air of being lived in, with its paved walks, and heavy shade from large trees. It is not a large court like the bare open area first seen. One would judge its size to be about 60 x 100 feet. At the center, at the intersection of two walks, stands the first of the ancient bronze instruments. This is a celestial sphere, a globe of bronze having the constellations shown upon it in silver and mounted on a moulded stone base. Beyond this court lies a third, in which we turn at right angles and proceed through a Moon Gate to a fourth and smaller court abutting on the massive city wall. Immediately upon entering this court we perceive a handsome bronze zodiac upheld by four fascinating bronze dragons. These are wrought most beautifully with delicate and elaborate detail. The instrument itself appears to be well made and accurate, as we are told it is. There

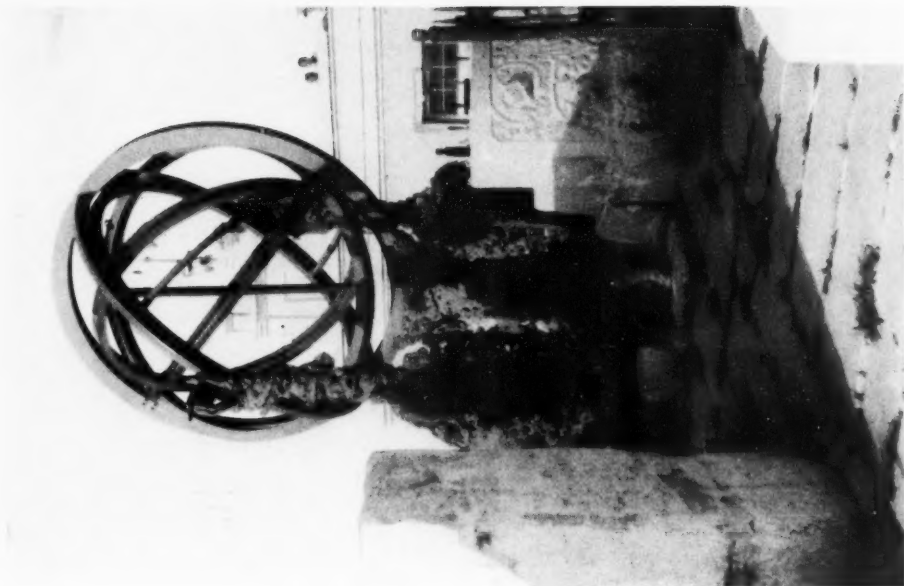


MOON GATE IN AN INNER COURT AT THE OBSERVATORY.



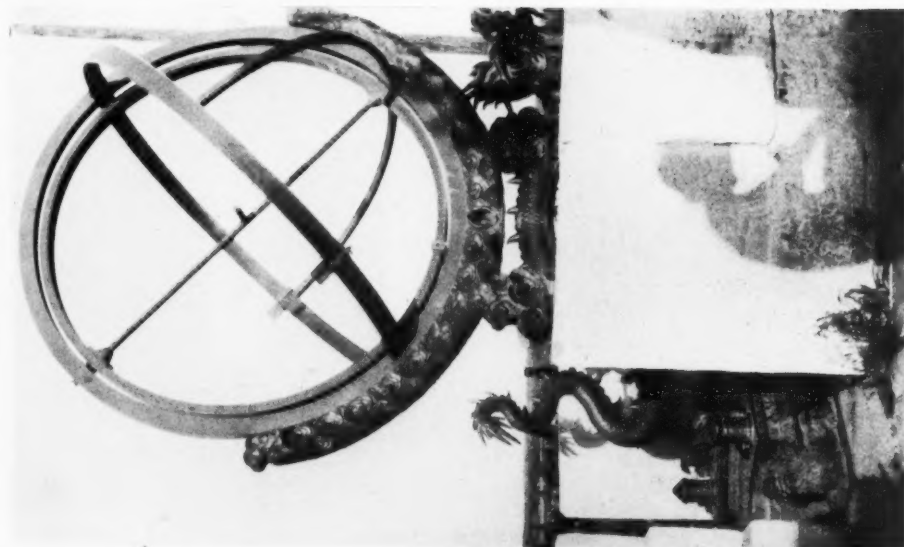
CONSTELLATIONS OF SILVER ON A BRONZE GLOBE.

CONSTELLATIONS OF SILVER ON A BRONZE GLOBE.

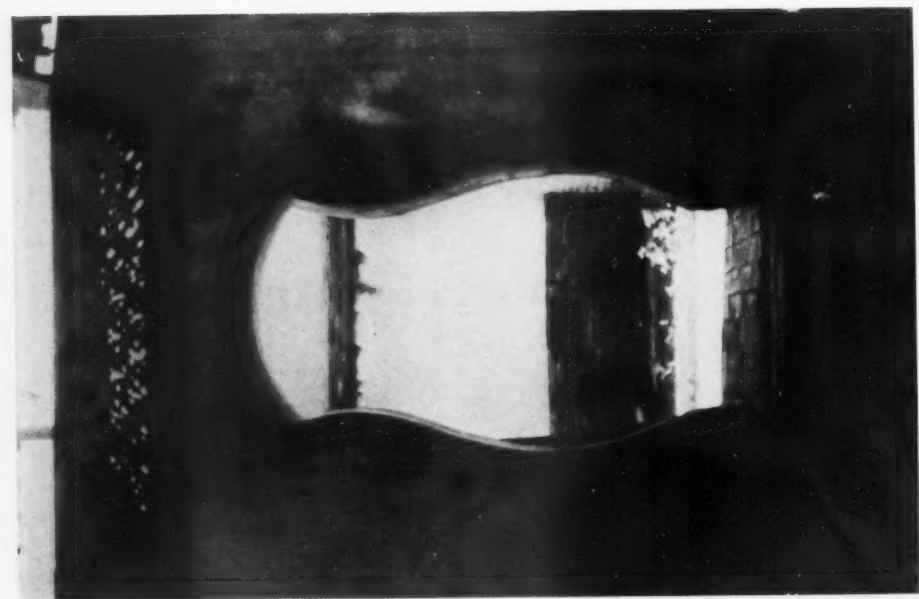


ARMILLARY ZODIAC.

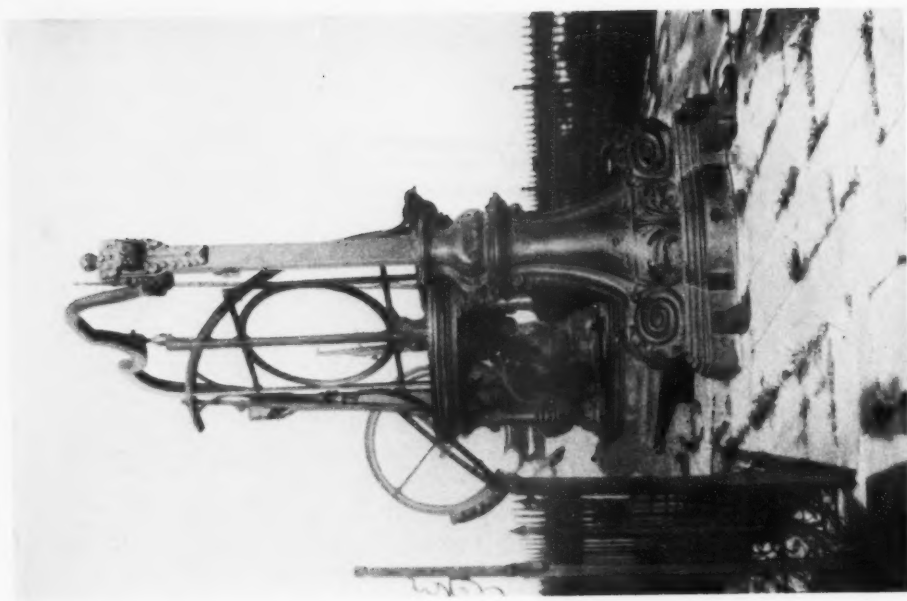
MOON GATE IN AN INNER COURT AT THE OBSERVATORY.



EQUINOCTIAL SPHERE.

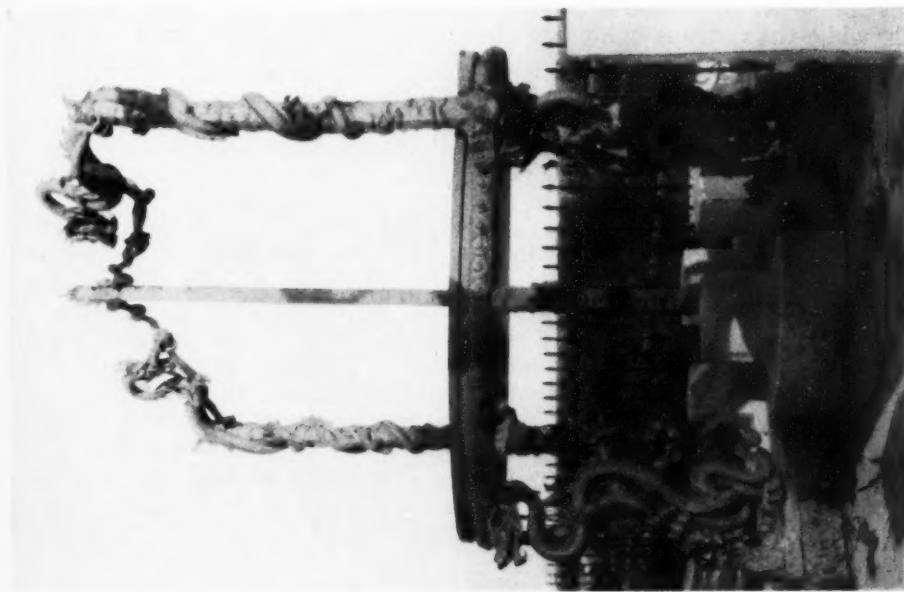


GATE IN THE GARDEN OF THE OBSERVATORY, PEIPING.

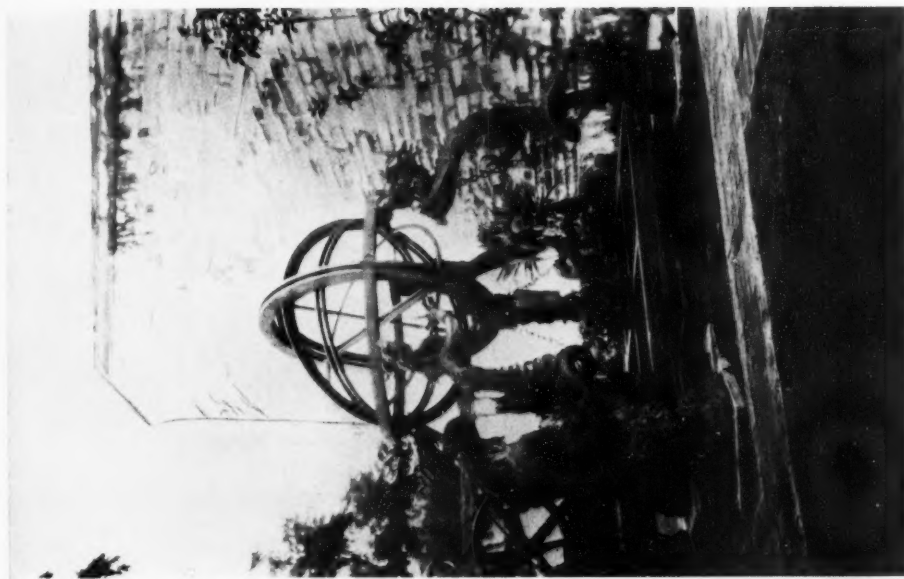


QUARTER CIRCLE.

GATE IN THE GARDEN OF THE OBSERVATORY, PEIPING.

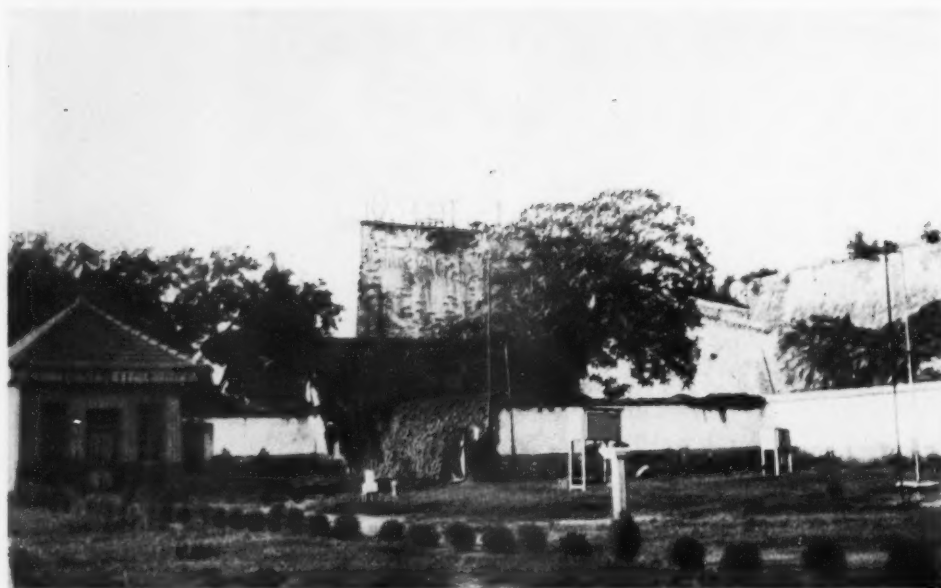


AZIMUTHAL HORIZON.



SEXTANT.

QUARTER CIRCLE.



ASTRONOMICAL OBSERVATORY IN PEIPING.

are two other bronze instruments in this same court. All of those on the ground level are moderate in size. The globe stands perhaps seven or eight feet high, while the dragons upholding the armillary zodiac are approximately the same height. At the end of the court there is a "keyhole" door and at the side a broad ramp leads upward toward the top of the wall on which can be seen more bronzes. These on the upper level are much larger than those below, the tallest being twelve or fifteen feet high. They are more massive and solid, less playful in their ornamentation. Their lines and form show the French influence but they are covered with fine modelling and design that is distinctly Chinese.

These bronzes, we are told, are those famous ones which were seized by the Germans after the Boxer Rebellion and taken to Berlin, but returned to Peking by the terms of the Armistice after the

World War. They were designed and cast under the direction of Father Verbiest, a Jesuit priest and missionary to China in the early XVIIth century. Father Verbiest was well received at the Chinese Court and accorded great honors, and when his mathematical ability became known, he was made President of the Mathematical Faculty, and so came into control of the Astronomical Observatory. It was in this capacity that he ordered the new instruments cast and set up, replacing the older ones so long used. Some of the instruments were presented by Louis XIV of France, while others were cast in Peking. They include an azimuthal horizon, an equinoctial sphere, a quarter-circle, a sextant, a celestial globe, and an armillary zodiac.

The brains of a clever mathematician, the art of a great designer and the skill of superlative craftsmen all wrought together to complete these

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bronzes. French lines and Chinese details are inextricably mingled in their final form. And so well were they made that even today there are no "new models" to displace them. Modern usage and new inventions have outmoded them, rendered them archaic, but for their type nothing better has ever been made.

Crowded as they are on a small area atop the city wall, they lack the setting necessary to display them to good advantage. Yet even thus one is impressed by their intricate detail, their precision, their form and ornamentation. They stand exposed to the elements, unprotected, guarded by a few coolies, yet they do not seem discolored or otherwise injured by rain and sun.

And after all, astronomical instruments are not intended for display but for a definite use.

Coming down from the wall we are directed not to return through the several courts but pass through the keyhole door into a last area where there are an oblong stone table and several smaller modern instruments without special interest and thence through a charming Moon Gate to the outer area.

Such is one of the oldest observatories in the world—still standing on the site it occupied under Kublai Khan in the year 1279, and still functioning drowsily as it has through these many centuries.

A SHORT VIEW OF DUTCH ART

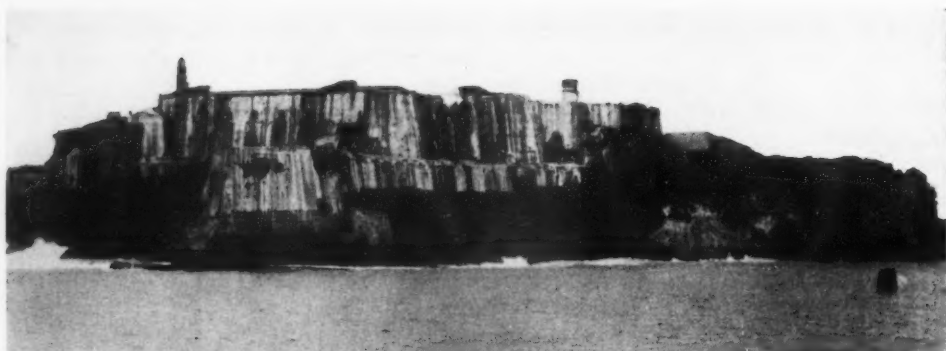
(Concluded from Page 29)

French art, his single color tone and difficult presentations forming the example which was best worth imitating. Catching all that was worth while in full detail with his agile pencil, with little inspiration, he yet managed to excel. The so-called miniature masters of cabinet art, with Gerard Dou and van Mieris at their head, sound very prominently through this era.

The entire XVIIIth century and even a part of the XIXth witnessed the painters of Holland tarrying along the lines laid down by their forefathers. There came a long period of artificial art, with independent characteristic details, the most significant of which was originality.

It was first about the middle of the XIXth century, and at the beginning of the romantic influence, that there

sprang into being a new, independent school of art. With the beginnings of what might be called Dutch impressionism, that opposed the dead school of the painter's art, confining itself to the expression of emotions and of modesty, this so-called Hague school developed and enjoyed for a considerable period its well-deserved glory. During the XXth century, one finds the period in which it has continued too limited to judge in the case of the modern Dutch exponents, just what they will produce. Of all of them Vincent van Gogh is here considered the most worthy representative and forerunner of what may be expected, for which reason he is probably to be reckoned within the coming international movement already visible on the horizon.



FORT "EL MORRO", AT THE ENTRANCE OF THE BAY OF SAN JUAN, PUERTO RICO.

NOTES AND COMMENTS

PRESERVE SAN JUAN'S OLD FORTIFICATIONS

The Joint Civic Committee of Puerto Rico has recently sent out an appeal for the immediate survey and repair of the ancient Spanish fortifications of the city, which are in such a condition at present through neglect as to need immediate reconstruction and repair in certain parts if they are to be saved for posterity.

These permanent fortifications consist of a complete defensive unit (citadel) once affording continuous and direct protection to the City of San Juan on every point of the compass. It comprises an extensive system of masonry structures—weather-beaten and hoary with age—massive fortresses, picturesque bastions, typical bulwarks and miles of connecting walls of great thickness, sometimes castellated, sometimes cut by embrasures and loop-holes.

Embodying as these fortresses did, the last hopes of the monarchy which attempted in vain to hold together the crumbling edifice of the colonial empire of Spain, they stand today as mute and melancholy witnesses of past greatness, transmitting to future generations a message whose significance shall not escape the acumen of liberty-loving man.

Within the Citadel proper, protected communication among the four main structures of the system—forts El Morro and San Cristóbal and the more ancient castles of La Fortaleza and Casa Blanca—was provided by means of underground passages, and, within the forts themselves, by sally-ports and covered passages. The supply of arms and ammunition was facilitated by four strongly-built powder-houses, distributed along the islet of San Juan, and beyond it, at Miraflores battery.

If we bear in mind the fact that the construction of the entire system did not end till the 18th century—having begun in the first third of the 16th—it will be readily seen why it admirably exemplifies today the progress of the art of military architecture throughout that period, with most of the resources of the Spanish school during the XVIIth and XVIIIth centuries finding expression in its complicated tracery. One castle (fortified residence) flanked with two round towers; two major fortresses; over a dozen bastions; massive curtains, redoubts, ravelins and other works; parapets topped with stone sentry-boxes of beautiful design,

casemates of impeccable form, deep moats and sombre dungeons, make up this treasure of inestimable historical and archaeological interest.

Expenditures aggregating some \$52,000 have been advised at different times by the military authorities of the island, but thus far only \$4,000 have been actually spent, and the need is imperative for an immediate survey, at a cost of some five thousand dollars, and then repairs to whatever amount may be required. To permit these magnificent structures to decay would be characteristic of the usual short-sighted policy of the United States; but it is to be hoped fervently that Congress will mingle a little sentiment with its daily ration of law, and see to it that our children do not vainly ask what the forts of Puerto Rico looked like.

BRIEF TRANSLATIONS

From the French magazine *Beaux-Arts* for March 20 we learn that the new excavations at Herculaneum, in the second section of the Decumanus Minor, have resulted in the discovery of a house decorated with astonishing frescoes representing country scenes and the hunt. In this house was also found a fine bronze candelabrum 1.80 m. high, its base formed by three pairs of animal-paws upon a pedestal. Construction of a monumental entrance on the Resina-Herculaneum road is proceeding. The gateway will be ornamented by six statues, showing different types of the dancing girls of the ancient city. Outside will be a *place*, 500 metres square, and a road bordered by olives and laurels will lead direct to the excavations. "One must note," continues the article, "the new character presented by these excavations by comparing them with the older ones at Pompeii. At present the archaeologist is not content to disengage walls and parts of houses from the debris, but exerts himself to present the ancient architecture in all its detail of construction and decoration, and to replace, wherever at all possible, every object discovered in the ruins, finally giving each edifice as nearly as the facts permit, its primitive appearance."

The same magazine reports that at Lake Nemi a remarkable gilded bronze herm with a double face, set Janus-fashion, of faun and satyr, has been brought to the surface.

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A DESCRIPTIVE EAKINS CATALOGUE

To the Editor of Art and Archaeology:

The writer is preparing a book on the work of Thomas Eakins, in which he intends to include a descriptive catalogue. At the time of the recent large exhibition of Eakins' work at the Pennsylvania Museum of Art, the Museum published a list of all his pictures known at the time. Since then a number of additional pictures have come to light, and it is probable that there are still more in the hands of private owners, collectors, or dealers. The writer would appreciate it very much if the owners of any such pictures, or those who know of their existence, would communicate with him at the address given below, as his aim is to make as complete a record as possible of the work of one of the foremost American artists of the last generation.

LLOYD GOODRICH,
57 Middagh Street,
Brooklyn, N. Y.

AMERICANS NAMED FOR CARNEGIE COMMITTEE AND JURY

It has been announced from Pittsburgh that the American Committee of Selection for the 29th Carnegie International will be composed of Charles Burchfield, Emil Carlsen, Bernard Karfiol, Ross Moffett and Horatio Walker. Both Carlsen and Walker are veterans and both have served on previous Carnegie juries. Carlsen, with Karfiol and Moffett, will also serve on the International Jury of Award with three European artists. The Jury will meet in Pittsburgh September 23 to decide the Carnegie honors and the A. C. Lehman Prize and Purchase Fund.

DR. SPEISER TO MESOPOTAMIA

Professor E. A. Speiser, of the University of Pennsylvania Museum has left for Iraq as Director of the joint Expedition of the University of Pennsylvania Museum and the American School of Oriental Research at Tepe Billi, near the great oil-field of Mosul. "The mound," Prof. Speiser writes *ART AND ARCHAEOLOGY*, "is one of the largest in Northern Mesopotamia and contains remains of several periods, starting with the aeneolithic painted pottery and continuing up to the time of Sennacherib, whose palace, attested by several inscriptions I found on the spot in 1927, we expect to uncover in the first year of our campaign. Though I must be back for the season of 1930-31, the expedition will continue, it is hoped, under the direction of some members of my present staff."

ALEXANDER'S TOMB

A number of inquiries have been recently received in the office of *ART AND ARCHAEOLOGY*, requesting details of the search for the tomb of Alexander the Great now being made in Alexandria, Egypt. From the various reports that have reached the office from widely differing sources, it has seemed that the matter rests at the moment largely upon speculation. Space is too valuable in a magazine of limited size, such as this, to devote it to either rumor or matter not well authenticated. The moment anything of value transpires in connection with the efforts now being made, it will be given proper notice.



"LA FORTALEZA", OR GOVERNMENT HOUSE AND SURROUNDING SEA WALL. NOTE CITY GATE IN FOREGROUND. SAN JUAN, P. R.

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THE MADONNA OF WASHINGTON. MODELLED BY
MRS. VICKEN VON POST TOTTEN.

"THE MADONNA OF WASHINGTON"

The ancient saw that a "prophet is not without honor save in his own country" is being more and more regularly disproven by American acceptance of American artists. One of the most recent examples is the commission just executed by Mrs. Vicken von Post Totten, wife of George Oakley Totten, Jr., the Washington architect. Mrs. Totten has completed and recently

exhibited a delightful plaster figure of the Virgin as a young girl, which she calls *The Madonna of Washington*. The order for the statue was given by Miss Hagan, and the statue is to be placed in the Church of the Immaculate Conception, in the national capital, next October.

Mrs. Totten's conception of her theme is strikingly original, and her delicate polychrome treatment adds in no small degree to her tender and sympathetic modeling of both face and figure. She has succeeded in retaining all the sweetly pure immaturity of her subject without in the least rendering it insipid. Her modeling of the hair and robes is admirable, and the figure, viewed from any angle, presents a thoroughly well-balanced whole. It is in the face, however, that Mrs. Totten's plastic skill stands out most strikingly. Though the sculptress used no model for it, she achieved so astonishing a result that a young Washington woman was startled by its likeness to herself, though she and Mrs. Totten had never seen each other until after the figure was completed.

THE CHILD PORTRAIT OF DR. WASHINGTON

Hanging in the Cosmos Club in Washington on temporary display is a portrait of the noted physicist of the Carnegie Institution, Dr. Henry S. Washington, recently finished by the painter Edwin B. Child. Mr. Child, whose portraits of well-known men and women are too familiar to need comment, sketched Dr. Washington at his work in the Geophysical Laboratory of the Carnegie Institution, sleeves rolled up, eyes wide and alert, mind concentrated. The result is a remarkably forceful and direct portrait that not only gives the full personality and likeness of the subject, but reveals the painter as amply dowered with both subtlety and sympathy. Working with a very restricted color range and keying his picture high, Mr. Child has relied for his effects upon his own direct thought and certain touch. This portrait is as sure and straightforward as anything of Frank Duveneck's, and while it is full of the whimsical geniality for which Dr. Washington is noted, there is not a trace of that saccharine gumminess which mars so many otherwise excellent portraits. In spite of the possible temptations of a laboratory and its accessories, Mr. Child has sternly repressed everything but his subject, and the brushwork of his simple background is genuine and solid. The only valid criticism that might be leveled against the canvas is of the restricted palette, though even this falls, for there is color enough.

Another practical effect that archaeological work has had upon the prosperity and development of a community has occurred in southeastern Sicily where, according to *Le Vie d'Italia* of Milan, the Greek Theatre, has attracted so many motorists that a new road and special parking-place capable of accommodating 400 machines at one time, have been constructed. The new route from city to theatre is shorter than the old Via dei Monumenti. Slow traffic has been ordered wholly confined to it, thus keeping the new road entirely clear for the convenience and comfort of the visitor who has come to mean so much in this island "Garden of the World."

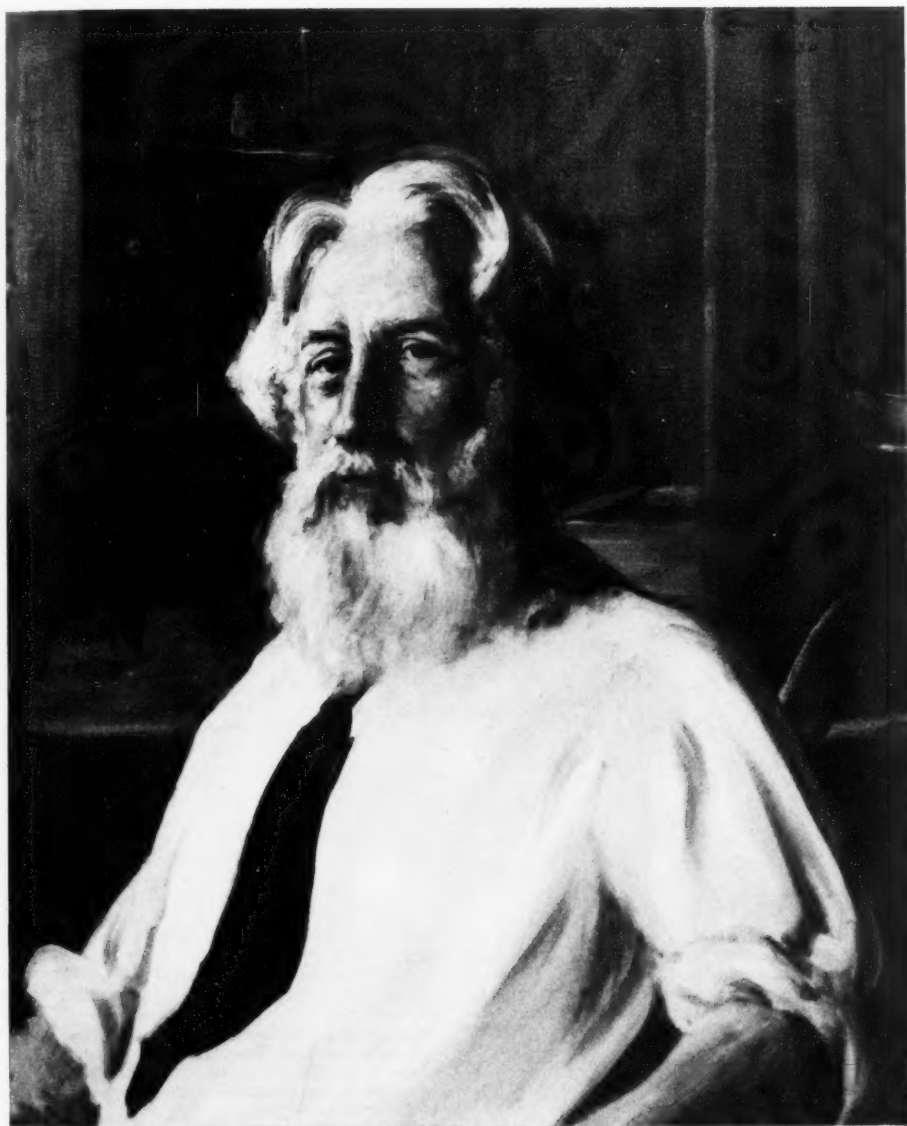
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DR. HENRY STEVENS WASHINGTON (IN HIS LABORATORY).
PAINTED BY EDWIN B. CHILD.

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Courtesy of University of Pennsylvania Museum.

GRAFFITO NO. 5, FROM MEYDUM.

"GRAFFITO NO. 5"

The curious reproduction on this page of an inscription cut into the western wall passage of the Pyramid of Meydum, was discovered by the University of Pennsylvania Museum's recent expedition, other reports from which have been published in this department during the past year. The inscription records that about 3,300 years ago a scribe named Aa-kheper-ka-ra-senb visited the pyramid. He "came here to see the beautiful temple of the Horus (king) Sneferu," and found it "like heaven within when the sun-god is rising in it." Mention is also made in the text of Sneferu's queen, the lady Me-res-ankh.

ART AS A SPIRITUAL FACTOR

In his address at the dinner of the American Federation of Arts, held at the Mayflower Hotel in Washington, May 16, 1930, His Excellency the Italian Ambassador, Nobile Giacomo di Martino, said in part:

"What I would like to point out to you is the powerful influence of art as a spiritual factor of friendship, confidence, and mutual understanding between nations—and God knows the peoples of the world need it. In all epochs of human history spiritual factors have been behind great and small events. I may say that in our times, which are rightly qualified in a certain sense as an epoch of mechanical progress and mercantile endeavor, spiritual factors seem to be rather obliterated. But on close examination I am inclined to think this is not entirely correct. Even in harsh material competition, even together with the wonderful modern scientific discoveries that seem to absorb the minds of men in our days, you can observe an unconscious trend toward that higher part of ourselves which is the Spirit. And when we say Spirit we mean the reflection of divinity, that is Harmony. And Harmony means Beauty, and Beauty means Art. Therefore we can assert that art in the very name of eternal Beauty constitutes a powerful spiritual factor of harmony between the nations of the world which have been created to live in peace between themselves, according to their divine destinies.

Italy is and has been a field of observation and teaching to the peoples of the world in artistic perfection. But today, besides artistic Italy, you have modern Italy endeavoring to keep pace with other nations in the field of international commerce, of industrial progress, notwithstanding our lack of raw materials.

We supply the lack of raw materials with work. All of you who go to Italy recognize that the Italian people are working hard, efficiently, and with a wonderful spirit of national discipline. Work, efficiency, and the spirit of discipline and sacrifice, together with renewed national pride—this is our slogan. The philosophy of our system of political and social organization consists in the substitution of the principle The State for the citizen, with the principle of the citizen for the State. We have substituted the principle of the struggle of classes with the principle of collaboration of classes.

These achievements, acknowledged by every impartial observer, are linked with the name of a man, to whom I think not only Italians but people of many other nations owe a debt of admiration and gratitude, our great leader Benito Mussolini.

And what about Fine Arts? Some recent publications have depicted Fascism as hindering the development of arts, accusing it of giving an excessive impor-

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tance to industrial and economic problems. This is only a new evidence of the false propaganda going on against the truth and against Italy.

The artistic beauty of our past is conceived by our National government as a spur to give the spirit the necessary strength to move toward the conquests of the future. Signor Mussolini himself is an intelligent connoisseur of art, personally cultivating the fields of letters and music.

Within a few years Fascist Italy has done much for the reorganization and embellishment of its museums and galleries. All of the principal collections have undergone and undergo noteworthy transformation. In Rome, our capital, a new museum has been opened of Ancient and Modern Art. In the Spada Palace, bought by the Government, the gallery is being reorganized. The palace of the Farnesina, containing as is well known, mural paintings by Raffaello, is being prepared as a seat for the Academy of Italy which has been recently created and comprises the highest minds of modern Italy. The reorganization of the Pitti Galleries and of the Uffizi is complete. In Venice there has been opened for the public the Ca' d' Oro, presented to the State by a generous patron, Baron Franchetti, and there will be the inauguration of the Oriental Museum Marco Polo, the richest in Italy. And the same at Mantua, where, as I may remember incidentally, the celebration of the second millenary of Virgil the poet will take place in these days. The same may be said of Bologna, Modena, and Parma and other cities.

I also wish to remind you that, thanks to the national government, we have instituted what Americans would call the most democratic of reforms in this field: the entry fee to all museums, excavations, galleries, etc., has been abolished.

New excavations are being opened at Rome, Pompeii, Herculaneum and in our North African Colony which reveal new artistic treasures, wonders of the past centuries. Entire palaces have been revived in the heart of Rome, which intensify the particular character of the eternal city as an illustrious bond between a glorious past and a brilliant and assured future.

It has been the Italian Government which has conducted the work of draining the Lake of Nemi in order to recover the ships of Caligula.

And by the Royal Government Rome has been presented with a theatre worthy of the Italian capital which for dignity of design, size and beauty is comparable to the Scala of Milan and the S. Carlo of Naples, among the finest theatres in the world.

The Government gives help and subsidy to conservatories, institutes of fine arts, libraries, theatres.

The personal order of the Chief of the Government has brought about the splendid exhibition of Italian Art in London which has been followed with the keenest interest throughout the world.

I am glad to say that by the initiative of the Italy-America Society of New York an exhibition of masterpieces of Italian art existing in the United States will be held next year in this country.

You know what the name of Rome means to us Italians—the Eternal City. Rome is to us a reality and a symbol. It is the origin of our nation, its glorious center, the symbol of its unity.

And to the world as a whole, Rome is the center of classical civilization, the source of Latin culture and the mother of law. Really Rome belongs to Italy as well as to humanity, and the majesty of her name spreads over thousands of years of human history.

I am rather inclined to believe in the magic force of symbols. Is it possible that symbols, in some unknown way, exercise mysterious influences on human events?

I am putting this question to you with a purpose as I come to my conclusion. Do you know what was the name, the original name of this part of our country, where the City of Washington was built later on? It was Rome. I am quoting the well-known "Collier's New Encyclopedia," Volume 10, page 303: "In 1633 Francis Pope, an Englishman purchased the original site of Washington from the Indians and named it Rome. The hill on which the capitol stands he called Capitoline Hill, and the Anacostia or East Branch River the Tiber."

Certainly the Englishman who nearly three hundred years ago made this purchase from an Indian tribe could not have had the slightest idea that on the very spot of his new private property George Washington, the Father of your Country, one hundred and twenty-seven years later, would establish the capital of the United States of America.

I see in this wonderful coincidence a twofold omen. First, the City of Washington as the Capital of the United States will follow the City of Rome in the path of glory and humanitarian achievements. Second, that both names of Rome and Washington, linked together, shall always represent between Italy and this country a bond of friendship, understanding and confidence."



A FAMOUS SENTRY BOX ON THE ANCIENT WALL OF SAN JUAN, P. R.

BOOK CRITIQUES

Pompeii in Three Hours. By Tatiana Warscher. Pp. vii; 165. 100 illustrations. *Industria Tipografica Imperia, Rome.* 1930.

Dr. Warscher, whose long familiarity with and writings on Pompeii have fitted her admirably for the task of beguiling the tourist into something more than the average slapdash visit, has in this thin and comfortable little volume, done a real service to others than the mere casual sightseer. Whoever is so fortunate as to take his Pompeii with this book as his guide will find the suggested three hours much too short, for the author has grasped the basic principle of alluring the reader to further consideration of the fascinating theme. She also knows her subject with a thoroughness nowadays all too uncommon. Both restraint and admirable handling of detail characterize the book, which may be heartily recommended as useful not only to the traveler but as a short work of reference in libraries as well. The linguistic difficulties and typographical errors are relatively few and unimportant, and in no instance likely to mislead the reader.

A Satchel Guide to Europe. By William D. Crockett. New revised (50th) Edition. Pp. cvii; 597. 8 maps and plans. *Houghton, Mifflin Co., Boston and New York.* 1930. \$5.

In presenting this new edition of the famous old traveler's compendium which has been making its way among a steadily increasing group of travelers for forty-nine years past, Professor Crockett has done a most unusual thing. Besides bringing his book thoroughly up to date by including all the latest information the tourist needs, the author has excluded Spain and Portugal bodily. Such a drastic revision seems to call in question the title and scope of the work, for if Spain and Portugal are not a part of the Continent, we must revise our out-of-date geographies. The reason for the omission is not, as it should be, stated in the preface, so far as this reviewer can see, and one gropes about rather helplessly, looking for what is now issued in much more comprehensive form as a complete, separate volume. Spain and Portugal, heaven knows, sorely need a first-class guidebook to themselves, and are to be congratulated on getting one. All the same, to omit even mention of two such important countries from the more general guide

is a serious error. In all other respects the work is admirably done and the excellent bibliography is an improvement over even last year's edition.

ARTHUR STANLEY RIGGS.

Ancient Painting, from the Earliest Times to The Period of Christian Art. By Mary Hamilton Swindler. Pp. xlv+484, 640 figures, 16 plates. *Yale University Press, New Haven.* 1929. \$10.

This is a monumental volume which fills a long-felt need. There has been no good history of ancient painting and yet in the last few years many wall-paintings have been unearthed in Crete, Southern Russia, Palestine and even Mesopotamia, to say nothing of new discoveries in Rome and Pompeii and the painted Stelae from Pagasal. Moreover in recent years Greek vases have been especially studied, good drawings of them published, and their artists identified by Beazley and others. Now was the time for such a book and it is no wonder that Miss Swindler has had to spend fifteen years in the preparation of the manuscript, though it is too bad that some of the chapters were completed eight years ago.

The plan is simple. Miss Swindler begins with prehistoric times and the chapters follow in chronological order the development of Egyptian, Oriental, Cretan, and Greek work down through Etruscan, Pompeian, Graeco-Roman and Roman painting. There are interesting digressions such as the chapters on "Drawing and Design on Greek Vases" and the excellent summary of "The Technical Methods and Pigments Employed in Ancient Painting". This discussion of technical problems is one of the most important features of the book. It has, however, sometimes shortened the account of Greek vases, the treatment of which is too brief. The bibliography for books is especially full and extremely useful. Unfortunately the same cannot be said of the bibliography of articles. The illustrations, which include fifteen plates, five in color, are abundant and well selected. In a few cases they are too small or dim for purposes of study.

In a book covering such a tremendous field it is natural to have omissions and minor errors. I miss in the bibliography the useful book of Ure, *Sixth and Fifth Century Pottery from Rhitsona* (1927) and especially the very valu-

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able book of E. M. W. Tillyard, *The Hope Vases*, where there is an excellent treatment of the South Italian vases. It would have been well to include the important museum catalogues of vases. Kinch was a great Danish archaeologist and wrote in Danish, not Dutch, as is said on page 456. Figure 245 is a crater, not a cup by Euphronius; the mosaic, figure 502 is not in Naples but *in situ* in the house of Romulus and Remus at Pompeii. On page 127, the vase representing the nymph Cyrene is Cyrenaic, not Laconian. On page 207, the bones of Theseus were brought back in 469, not 475 B. C. But this is not the place to criticize details. Let us rather congratulate Miss Swindler on completing a stupendous task.

This is one of the most comprehensive and encyclopaedic compilations published in America in the field of classical art and compares favorably with Pfuhl's epoch-making three volumes in German on the painting and drawing of the Greeks. It is thorough and scholarly, well-written and attractively printed. It will prove a useful introduction to the subject for the not-too-well informed student of classical archaeology, for students of art in general, and for the cultured reader. It should be widely adopted as a text-book and for general reading. The references for technique and analyses on page 377, for examples, are really valuable. I have already tried it as a text-book in a seminar on Ancient Painting and it has stood the test well. It is well worth ten dollars. Such a luxurious book, if published by the Oxford Press, would have cost double that price.

DAVID M. ROBINSON.

Art and Education. Pp. x; 349. Barnes Foundation Press, Philadelphia. 1929. \$2.00.

In this well-made book of three hundred and fifty pages we are told what the Barnes Foundation is doing and has done, and what are its theories of art and education.

It brings together a selected sheaf of the articles printed in the *Journal* of the Barnes Foundation, now discontinued and out of print, reedited discussions of current aesthetics, formulas and methods in art, a series of essays by John Dewey, Albert C. Barnes, Laurence Buermeier, Thomas Munro, Paul Guillaume, Mary Mullen and Violette de Mazze.

Professor Dewey expounds admirably his philosophy of art. Mr. Barnes fulminates. In general the "tradition" of the classic past is

seen as indispensable even to the most individual creations of modernism. There is learned appreciation of the old great masters, who have, we read, "anticipated" the moderns. Present-day theories of aesthetics and their protagonists are attacked in lively bouts where the thrusting is fierce. We have only, of course, one side of the affair, and must imagine the riposte, but, especially with Mr. Barnes, the buttons are off the foils. As, for instance: "The Wessman Ross method reflects an ignorance of human nature which is as profound as his ignorance of science and art." Or when he punctuates Mr. Jay Hambidge's "dynamic symmetry" as an illogical and dogmatic assumption, a recipe for making chaff look like wheat. Or when he says pleasantly of Mr. Walter Pach's system as set forth in his writings and lectures for those who "pursue culture in crowds as though it were dangerous to meet alone": "Mr. Pach has caught the patter of modern aesthetic theory but is almost helpless in the presence of an actual work of art. He swallows platitudes right and wrong." And, to make an end, "the crowning proof of Mr. Pach's ineptitude is his praise of Werain, the painter of best sellers." "Disastrous," he says of Mr. Elliott's teaching—Mr. Huger Elliott of the Metropolitan Museum—"dogmas fatal to either appreciation or Creation of works of art." Roger Fry he seems to handle rather warily but it is fairly awful to read him beating down poor Frank Jewett Mather's guard with such bludgeoning words as "obsolete", "irrelevant", "rhapsodical", "banal". However, there has been poured out pro and con a weary waste of words about all these matters. No doubt people are a bit tired of it all. We have lost confidence in our critics, who have, perhaps, protested overmuch. We even sometimes wonder if they are more or less unconsciously pulling the public's leg at the instigation of publishers and dealers. There does seem to be a lot of dealer's art about. Is there a taint of business in much of this blurb-ing of modernism? Is it mostly "making a market"? One of the queer things in this queer age of ours is the ready-made taste imposed upon us. A lot of it is snobbery on our part of course. The vogue sweeps us along. Besides, it is less trouble to accept the taste that parades authority. They know well how to handle us. The technic of the "drive" is well understood—since the war—and we are easily infected with a state of mind.

ART AND ARCHAEOLOGY

They make of art a mystery—worse than plumbing. "Significant form", eh? But significant of what? "Basic"—yes, but what is it? However, one must not be out of the fashion, out of date. These artists are creating the "authentic" expression of their age—heaven help it! Before their works plain folk are abashed. They know not what they mean. Many probably have always considered the human body "significant form," perfect for its function. And in their ignorance, distortion of it seems to destroy its perfect symmetry and impede function. This is, we are told, somebody's personal feeling about form. Well, but what of it? Is it of any consequence? What though Renoir delight in fat flesh, in pinguid callipygic redundancies painting them magically, as Rubens loved and painted them! Must the public admire? A great sculptor of today allures us with cowlike thick-legged peasant girls, like balloon tires; a second prefers them square; a third, the last thing in expressionism, models a dome over his lady's heart, while on the other side of her chest she is like the "little sister" of the Song of Songs. And should one not care for these "contemporary manifestations", these expressions of personality, should one be written down a "hostile academician"?

A. BURNLEY BIBB.

Idols Behind Altars. By Anita Brenner. 359 pages, 118 illustrations. Payson and Clarke, Ltd. New York, 1929. \$5.

Miss Brenner's *Idols Behind Altars* is in many ways an exciting book. The style is vigorous, the subject-matter is new, and the illustrations are gorgeous. In Mexico, apparently the expressionist may feel at home, provided he is a native, or as sympathetic a resident as the author. And yet the reader also gets an impression of lack of finish, as if the material was gathered or experienced and straightway prepared for the press without allowing distance and meditation a chance to sift it. With time the ecstatic prose would have cooled, and the jarring contours of art and action described would have formed patterns.

The earlier chapters deal with the spirit of Maya and Aztec and Spaniard as each has found adventure in Mexico—continuous struggle in warfare and rite and art toward the immanent permanence which seems to form the essence of the soul of Mexico. The later

chapters stress the recent revolutionary events and the expression given them by a group of creative artists, Orozco, Rivera, and the rest. A far-reaching thought is suggested when the writer shows revolutionary Mexico assuming a place of spiritual leadership of pre-revolutionary South America, and asks if the "primitives" we now admire may not be initiating an American school of painting of wide significance.

WILLIAM SENER RUSK.

EXAMINATIONS OF DOCUMENTS AND PAINTINGS

(Concluded from Page 35)

fluorescence at all, while others—and this applies particularly to minerals—vary to an extraordinary extent according to the country of origin. Whether such fluorescence can be excited by another part of the spectrum is not known, but this is among the possibilities of the future which will, if successful, increase the scope of the work tremendously.

By means of this method, historical research will be afforded the opportunity of gaining an immense amount of information from new sources. Pictures may yield the secrets of the brush, and manuscripts their age-old stories. The rays are not infallible and as technique is not yet perfected the progress may be slow. Nevertheless, the exceptionally fascinating problems of this work are attracting many scientists and further successes will undoubtedly be gained in due course. In the meanwhile, the method has proved itself of great practical application by being widely adopted in the fields of criminology and philately.

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